

# State of Idaho INEEL Oversight Program

---

## 2003 Environmental Surveillance Report

**A compilation and explanation of data collected by  
the INEEL Oversight Program during 2003**

State of Idaho, INEEL Oversight Program  
Environmental Sampling Coordinators  
Air: John Macklin  
Terrestrial: Luke Paulus  
External Radiation: Kristi Moser-McIntire  
Water: L. Flint Hall  
Water Verification: Kimberly Kaiser  
**Quality Assurance/Quality Control Coordinator**  
Bruce E. Olenick  
**Radiological Analysis Coordinator**  
Dr. Tom Gesell  
Idaho State University  
**Nonradiological Analysis Coordinator**  
IDHW Bureau of Laboratories



### Idaho Falls

900 N. Skyline Dr. Suite C  
Idaho Falls, ID 83402  
Ph. (208) 528-2600  
Fax: (208) 528-2605

### Boise

1410 N. Hilton  
Boise, ID 83706  
Ph. (208) 373-0498  
Fax: (208) 373-0429

### World Wide Web

<http://www.oversight.state.id.us>  
Toll Free: 1-800-232-4635

This report was funded by a grant from the U. S. Department of Energy, Grant No. DE-FG07-001D-13952

# Table of Contents

---

<b>Executive Summary</b>	
<b>INEEL OP Environmental Surveillance</b>	
<b>Program 2003 Results.....</b>	<b>ES-1</b>
 <b>Chapter 1</b>	
<b>Introduction .....</b>	<b>1-1</b>
 <b>Chapter 2</b>	
<b>Environmental Surveillance Program Scope and Affiliations .....</b>	<b>2-1</b>
 INEEL Oversight Program Environmental Surveillance Program	
History and Legislative Authority .....	2-1
The INEEL Oversight Program (INEEL OP).....	2-2
Other Surveillance Programs .....	2-5
Bechtel BWXT Idaho, LLC (BBWI).....	2-5
S. M. Stoller Corporation.....	2-5
United States Geological Survey (USGS) .....	2-6
Argonne National Laboratory (ANL-W).....	2-6
Naval Reactors Facility.....	2-6
Shoshone-Bannock Tribes .....	2-6
The INEEL OP Sampling Network and Co-Sampling Strategies .....	2-6
Air Monitoring .....	2-6
Air Monitoring Locations .....	2-7
Air Monitoring Equipment and Procedures.....	2-7
Air Samplers .....	2-7
Atmospheric Moisture Samplers.....	2-8
Precipitation Samplers .....	2-8
Air Monitoring Interprogram Comparison Design .....	2-8
Direct Radiation Monitoring.....	2-10
Direct Radiation Monitoring Locations .....	2-11
Direct Radiation Monitoring Equipment and Procedures.....	2-11
Electret Ion Chambers.....	2-11
High-Pressurized Ion Chambers .....	2-11
Direct Radiation Monitoring Interprogram Comparison Design.....	2-12
Terrestrial Monitoring .....	2-12

Terrestrial Monitoring Locations.....	2-13
Milk Sample Collection Sites and Dairy Locations.....	2-13
Soil Monitoring Locations .....	2-13
Terrestrial Monitoring Equipment and Procedures.....	2-14
Milk Monitoring.....	2-14
Soil Monitoring.....	2-14
Interprogram Terrestrial Monitoring Results and Comparisons.....	2-15
Water Monitoring .....	2-15
Water Monitoring Locations.....	2-16
Water Monitoring Equipment and Procedures .....	2-17
Interprogram Water Monitoring Results and Comparisons.....	2-17

### **Chapter 3**

#### **Air Monitoring ..... 3-1**

Primary Air Results and Trends.....	3-2
Particulate and Iodine 131Air Sampling.....	3-2
Atmospheric Moisture and Precipitation .....	3-7
Interprogram Comparisons of Air Sampling Results .....	3-10
Air Monitoring – Suspended Particulate Matter.....	3-10
Air monitoring – Gaseous Radionuclides.....	3-14
Precipitation Sampling.....	3-15
References. ....	3-16

### **Chapter 4**

#### **Terrestrial Monitoring ..... 4-1**

Primary Terrestrial Results and Trends .....	4-1
Milk Sampling .....	4-1
Soil Sampling.....	4-4
Interprogram Comparisons of Terrestrial Monitoring Results .....	4-5
<i>In Situ</i> Measurement Conducted with BBWI.....	4-5
References .....	4-6

### **Chapter 5**

#### **Water Monitoring ..... 5-1**

Primary Nonradiological Results and Trends.....	5-1
Common Ions and Nutrients .....	5-2
Calcium.....	5-3
Magnesium.....	5-3
Sodium .....	5-3

Potassium .....	5-3
Chloride.....	5-4
Sulfate .....	5-4
Nitrogen .....	5-5
Phosphorus.....	5-5
Trace Metals .....	5-5
Barium.....	5-5
Chromium .....	5-6
Zinc, Lead and Manganese .....	5-6
Primary Radiological Results and Trends .....	5-7
Gross Radioactivity .....	5-7
Gross Alpha Radioactivity .....	5-8
Gross Beta Radioactivity .....	5-8
Gamma Spectroscopy .....	5-8
Tritium .....	5-9
Strontium-90 and Technetium-99.....	5-12
Interprogram Comparisons of Water Results .....	5-14
<b>Nonradiological Results Comparisons.....</b>	<b>5-15</b>
Linear Regression Comparisons .....	5-15
Chloride.....	5-15
Chromium .....	5-16
Nitrogen Phosphorus.....	5-17
Sodium and Sulfate .....	5-18
Relative Percent Differences Comparisons .....	5-18
<b>Radiological Results Comparisons.....</b>	<b>5-20</b>
Gross Alpha Radioactivity .....	5-21
Gross Beta Radioactivity .....	5-21
Cesium-137 .....	5-28
Tritium .....	5-28
Enhanced Tritium.....	5-29
Strontium-90 .....	5-31
Summary of Differences .....	5-32
References .....	5-34

## Chapter 6

### Verification Water Monitoring Program ..... 6-1

Introduction.. .....	6-1
Comparison of Nonradiological Results .....	6-4
Comparison of Radiological Analyses .....	6-8
References. ....	6-10

## **Chapter 7**

### **External Radiation Monitoring... 7-1**

Ambient Penetrating Radiation Monitoring and Trends .....	7-1
Comparison of External Radiation Monitoring Results	
Reported by DOE Contractor .....	7-5
References. ....	7-8

## **Chapter 8**

### **Quality Assurance/Quality Control ..... 8-1**

Quality Assurance Program .....	8-2
Air Monitoring Quality Assurance .....	8-2
Terrestrial Monitoring Quality Assurance.....	8-2
Water Monitoring Quality Assurance.....	8-2
Gamma Radiation Monitoring Quality Assurance .....	8-3
Quality Control Assessment .....	8-3
Blank Sample Results .....	8-3
Spike Results .....	8-4
Electret Ion Chambers.....	8-5
High-Pressure Ion Chambers .....	8-5
Duplicate Results .....	8-6
Radiological Analyses .....	8-6
Nonradiological Analyses .....	8-7
Analytical QA/QC Assessment.....	8-8
External QA/QC.....	8-8
Resolution of Analytical Issues .....	8-8
Conclusion .....	8-9

## **Appendix A**

### **The Design and Development of the INEEL Oversight**

#### **Program's Environmental Surveillance Program..... A-1**

History and Legislative Authority .....	A-1
Environmental Surveillance Program Network Design .....	A-2
Air Monitoring.....	A-2
External Radiation Monitoring.....	A-3
Terrestrial Media Monitoring .....	A-3
Water Monitoring .....	A-4

## **Appendix B**

### **Glossary, Acronyms and Units ..... B-1**

Glossary .....	B-1
Acronyms .....	B-6
Units .....	B-8

## **Figures**

### **Chapter 2**

Figure 2-1. Air Monitoring Locations. ....	2-9
Figure 2-2. Routine Gamma Radiation Monitoring Locations.....	2-13
Figure 2-3. Milk Monitoring Locations.....	2-14
Figure 2-4. Soil Monitoring Locations. ....	2-15
Figure 2-5. Onsite and Boundary Water Monitoring Locations.....	2-17
Figure 2-6. Distant and Magic Valley Water Sampling Locations.....	2-18
Figure 2-7. Water Verification Monitoring Sites.....	2-19

### **Chapter 3**

Figure 3-1. Average gross alpha screening results of TSP filters collected during 2001 and 2003.. ....	3-4
Figure 3-2. Average gross beta screening results of TSP filters collected during 2001 and 2003. ....	3-4
Figure 3-3. Average quarterly tritium concentrations observed at monitoring stations on the INEEL, near the site boundary, and at distant locations since 1994.....	3-8
Figure 3-4. Average weekly gross alpha screening results for samples collected at Craters of the Moon National Monument, Experimental Field Station, Idaho Falls, and Van Buren Avenue. ....	3-11
Figure 3-5. Average weekly gross beta screening results for samples collected at Craters of the Moon National Monument, Experimental Field Station, Idaho Falls, and Van Buren Avenue.. ....	3-11
Figure 3-6. Airborne tritium concentrations at the Idaho Falls monitoring Stations during 2003.....	3-14
Figure 3-7. Airborne tritium concentrations at the Experimental Field Station and Van Buren Avenue monitoring stations during 2003.....	3-14

## Chapter 4

Figure 4-1 Routine milk collection points used by INEEL OP. ....	4-3
Figure 4-2 Reported concentrations of iodine-131 (primary y-axis) in milk samples collected by INEEL OP since 1996.....	4-4

## Chapter 5

Figure 5-1. Tritium concentration over time, wells USGS 65, USGS 112 and USGS 115	5-10
Figure 5-2. Tritium concentration over time, wells CFA 1, CFA 2, and USGS 85.....	5-11
Figure 5-3. Tritium concentration over time, wells RWMC Production, USGS 87 and 104. ....	5-11
Figure 5-4. Strontium-90 concentrations for wells CFA 1, CFA 2, USGS 85, and 112 ....	5-13
Figure 5-4a Dissolved technetium-99 concentrations for wells CFA 1, CFA 2, USGS 85, and 112 .....	5-13
Figure 5-5. Concentrations of chloride reported for replicate samples, INEEL OP versus USGS on and near the INEEL, 2003.....	5-16
Figure 5-6. Concentrations of chromium reported for replicate samples, INEEL OP versus USGS on and near the INEEL, 2003. ....	5-17
Figure 5-7. Concentrations of dissolved nitrite plus nitrate (as N) reported for replicate samples, INEEL OP versus USGS on and near the INEEL, 2003. ....	5-18
Figure 5-8. Concentrations of sulfate reported for replicate samples, INEEL OP versus USGS on and near the INEEL, 2003.....	5-19
Figure 5-9. Concentrations of sodium reported for replicate samples, INEEL OP versus USGS on and near the INEEL, 2003. ....	5-19
Figure 5-10. Histogram of differences between INEEL OP and ESER for gross alpha radioactivity, 2003.....	5-25
Figure 5-11. Histogram of differences between INEEL OP and USGS in the Magic Valley for gross alpha radioactivity, 2003. ....	5-25
Figure 5-12. Histogram of differences between INEEL OP and USGS on and near the INEEL for gross alpha radioactivity, 2003.....	5-25
Figure 5-13. Histogram of differences between INEEL OP and ESER for gross beta radioactivity, 2003.....	5-26
Figure 5-14. Histogram of differences between INEEL OP and USGS on and near the INEEL for gross beta radioactivity.....	5-26
Figure 5-15. Histogram of differences between INEEL OP and USGS in the Magic Valley for gross beta radioactivity, 2003.....	5-27
Figure 5-16 Histogram of differences between INEEL OP and USGS cesium-137 concentrations on and near the INEEL, 2003.....	5-28
Figure 5-17. Comparison of replicate tritium results (with 2-s error bars) for NEEL OP and USGS for sites on and near the INEEL, 2003.....	5-29
Figure 5-18. Histogram of differences between INEEL OP and ESER for tritium, 2003..	5-29
Figure 5-19. Histogram of differences between INEEL OP and USGS in the Magic Valley for tritium by the standard method, 2003. ....	5-29

Figure 5-20. Comparison of replicate results for tritium by electrolytic enrichment and liquid scintillation for the USGS MV and INEEL OP, in the Magic Valley, 2003 .....	5-30
Figure 5-21. Comparison of replicate results for strontium-90, INEEL OP and USGS on and near the INEEL, 2003. ....	5-31
Figure 5-22. Summary of relative differences between INEEL OP results and replicate results from ESRF and USGS on and near the INEEL in the Magic Valley.....	5-32

## Chapter 7

Figure 7-1. Penetrating radiation monitoring stations located on the INEEL maintained and operated by INEEL OP. ....	7-2
Figure 7-2. Penetrating radiation monitoring stations operated by INEEL OP at (offsite) INEEL boundary locations and distant locations.....	7-3
Figure 7-3. Average quarterly exposure rates observed at monitoring stations on the INEEL, near the INEEL boundary, and at distant locations using high-pressure ion chambers (HPICs) and electret ion chambers (EICs) .....	7-7.

## Tables

### Chapter 2

Table 2-1. INEEL OP Environmental Surveillance Program (ESP) summary, 2003 .....	2-3
Table 2-2. Interprogram air monitoring sampling/analyses schedules, 2003.....	2-10
Table 2-3. Direct radiation monitoring schedules, 2003 .....	2-12
Table 2-4. Interprogram water monitoring sampling schedules and analyses, 2003 .....	2-20
Table 2-5. Verification sampling program's water monitoring schedules and analyses, 2003.....	2-23

### Chapter 3

Table 3-1. Descriptive statistics for 2003 particulate air sampling gross screening results from TSP samplers. ....	3-3
Table 3-2. Annual radiochemical separation analysis data for TSP particulate filters collected during 2003.. ....	3-5
Table 3-3. Annual radiochemical separation analysis data for PM <sub>10</sub> particulate filters collected during 2003... ..	3-6
Table 3-4. Average quarterly airborne tritium concentrations.. ..	3-9
Table 3-5. Descriptive statistics of comparing INEEL OP gross alpha and gross beta screening results with DOE-ID results from co-located monitoring locations during 2003. ....	3-13
Table 3-6. Descriptive statistics of atmospheric tritium monitoring efforts at co-located monitoring stations during 2001 and 2003 .....	3-15



Table 3-7. Tritium concentrations observed in precipitation samples collected by INEEL OP and ESER at the Idaho Falls Station during 2001 and 2003.....	3-15
---	------

## Chapter 4

Table 4-1. Descriptive statistics for routine monthly milk samples collected by INEEL Oversight Program .....	4-5
Table 4-2. Descriptive statistics of <i>in-situ</i> gamma spectrometry measurements of cesium-137 in soil.. .....	4-5
Table 4-3. Descriptive statistics of co-located <i>in-situ</i> gamma spectroscopic results for <sup>137</sup> Cs performed by BBWI and INEEL OP during 2003 .....	4-8

## Chapter 5

Table 5-1. Summary of selected nonradiological INEEL OP water surveillance analytical results, 2003 .....	5-2
Table 5-2. Summary of selected radiological INEEL OP water surveillance analytical results, 2003 .....	5-7
Table 5-3. Regression parameters with 95% confidence intervals for the replicate samples collected by the USGS and the INEEL OP, 2003.....	5-15
Table 5-4. Comparison of common ion, nutrient, and trace metal concentrations reported for replicate samples, 2003.....	5-20
Table 5-5. Sampling and analysis techniques for gross alpha and gross beta samples collected by the INEEL OP, USGS and ESER, 2003.....	5-21
Table 5-6. Summary of linear regression parameters with 95 percent confidence intervals for the replicate samples collected by INEEL OP, USGS and ESER, 2003.....	5-22
Table 5-7. Summary of paired t-tests for replicate samples analyses, 2003.....	5-23
Table 5-8. Summary of mean differences between results of replicate pairs, 2003 .....	5-24

## Chapter 6

Table 6-1. Range of concentrations reported for INEEL OP samples collected with ANL-W, BBWI and NRF, 2003 .....	6-2
Table 6-2. Comparison of wastewater concentrations of common ions, nutrients, and trace metals reported for replicate samples collected with ANL-W, BBWI, and NRF, 2003.....	6-5
Table 6-3. Comparison of groundwater concentrations of common ions, nutrients, and trace metals reported for replicate samples collected with ANL-W, BBWI, and NRF, 2003.....	6-6
Table 6-4. Comparison of concentrations of volatile organic compounds reported for replicate samples collected with BBWI and NRF, 2003.. .....	6-7
Table 6-5. Comparison of radionuclide concentrations reported for replicate samples collected with ANL-W, BBWI, and NRF, 2003.. .....	6-9

## **Chapter 7**

Table 7-1. Estimated HPIC response from NCRP 94 and cosmic ray response, corresponding action level, average HPIC response observed during 2003, and 2003 in-situ gamma spectroscopy estimated exposure rate. ....	7-4
Table 7-2. Average exposure rate measurements at routine monitoring stations using high-pressure ion chambers (HPICs)....	7-5
Table 7-3. Average exposure rate measurements at routine monitoring stations using electret ion chambers (EICs).....	7-6
Table 7-4. Descriptive statistics of HPIC and EIC measurements made during 2003 at boundary, distant, and onsite locations.....	7-6
Table 7-5. Descriptive statistics of environmental dosimetry comparison results for 2001 and 2003 between INEEL and DOE-ID contractors for monitoring environmental penetrating radiation. ....	7-8

## **Chapter 8**

Table 8-1. Summary of quality control samples collected in calendar year 2003.....	8-4
Table 8-2. Quality assurance irradiation summary of EICs conducted in 2003 .....	8-5
Table 8-2. 2003 summary of HPIC source field checks. ....	8-6

# *Executive Summary*

---

## *INEEL OP Environmental Surveillance Program 2003 Results*

---

### **Results Summary**

The Idaho National Engineering and Environmental Laboratory Oversight Program (INEEL OP) Environmental Surveillance Program (ESP) operates an extensive monitoring network to measure the condition of air, water, and external radiation in and around the boundaries of the INEEL operated by the U.S. Department of Energy (DOE). This network also measures terrestrial impacts of the INEEL via the sampling of soil and milk in the region.

After completing an independent assessment of the environmental conditions during 2003 in the vicinity of the INEEL, the INEEL OP, which is a division of the state of Idaho's Department of Environmental Quality, concluded:

- No offsite environmental impacts from INEEL operations were evident as a result of environmental air, radiation, soil, and milk monitoring conducted by the INEEL OP.
- No contamination attributable to the INEEL was identified in water samples collected at distant or Magic Valley monitoring sites, however, INEEL impacts can be identified at some sites along the southern boundary of the INEEL. Tritium concentrations at these sites were greater than background but less than 1 percent of drinking water standard. Chromium at these sites also exceeded background but was less than 5 percent of the drinking water standard.
- Analytical data reported by surveillance programs of the INEEL OP and DOE generally agree.

The following provides additional summary information concerning the major findings of each component of the INEEL OP monitoring network.

## Air Monitoring Major Findings:

Air samples collected by the INEEL OP in 2003 were screened for gross alpha and gross beta radioactivity, gamma radioactivity, and analyzed for tritium contained in atmospheric moisture. Radiochemical analyses were performed on composited air filters for strontium-90, plutonium-238 and -239/240, and americium-241.

Gross alpha and gross beta screening measurements of particulate air filters were consistent with historical background concentrations. Elevated concentrations were observed during periods associated with temperature inversions. Atmospheric tritium and tritium concentrations in precipitation samples collected at boundary and distant monitoring locations were consistent with the range of historical background concentrations observed by INEEL OP and typically below detection levels.

- No offsite environmental impacts from INEEL operations were evident based on the results of particulate air sampling.
- Strontium-90, americium-241, plutonium-238, and plutonium 239/240 were measured at several monitoring locations. Concentrations were slightly greater than the laboratory's detection capability, yet were significantly below the INEEL OP action levels which are 10% of the limits established by the Clean Air Act. Measurable quantities of these radionuclides are expected in the environment due to historic above ground testing of nuclear weapons.
- No radioactive iodine was detected in air.
- No radioisotopes from INEEL operations were detected in precipitation samples.
- Tritium was measured in atmospheric moisture samples collected at several onsite monitoring locations. Concentrations were slightly greater than the laboratory's detection capability, yet were significantly below the INEEL OP action level.
- Comparisons of INEEL OP air monitoring results with DOE program results show relatively good agreement.

## Terrestrial Monitoring Major Findings:

Terrestrial environmental surveillance typically includes examination of several mechanisms that tend to collect and/or accumulate radioactive material in the environment. Such mechanisms are monitored through the sampling of milk and soil in and around the INEEL. Additionally, the INEEL OP conducts *in-situ* soil measurements on and around the INEEL for selected naturally occurring and man-made, gamma-emitting radionuclides. The locations for soil and milk sampling reflect the consideration of potential source terms, their significance, regional meteorology, and monitoring activities by other programs.

Gamma spectroscopic analysis of milk samples collected during 2003 and *in-situ* gamma spectroscopic measurements for radionuclide concentrations in soil were performed throughout 2003. INEEL OP observed no man-made radionuclides in milk samples collected during 2003, specifically iodine-131 ( $^{131}\text{I}$ ). Cesium-137 ( $^{137}\text{Cs}$ ) concentrations observed in soil on and around the INEEL were consistent with historical measurements and within expected background concentrations attributable to historical atmospheric nuclear weapons testing.

- No offsite environmental impacts resulting from INEEL operations were indicated as a result of the analyses of milk or soil samples.
- Comparisons of INEEL OP terrestrial monitoring results with DOE program results show good agreement.

## **Water Monitoring Major Findings:**

Water monitoring is conducted on or around the INEEL for the primary purpose of examining trends of key INEEL contaminants and other general ground water quality indicators. Water monitoring is also conducted at select verification sites and sampled for the primary purpose of verifying DOE monitoring results for selected facilities. Included within the program are targeted groundwater and surface water locations on and near the INEEL, and selected wastewater sites for INEEL facilities. All water monitoring activities are conducted with other organization including the USGS, ESER, BBWI, NRF, and ANL-W.

- Gross beta radioactivity, tritium, strontium-90, and chromium concentrations exceeded EPA drinking water standards in the Eastern Snake River Plain Aquifer beneath several facilities at the INEEL. Contaminant concentrations generally decreased or remained constant through 2003.
- Drinking water standards were not exceeded at any sites where water is used by the public or INEEL workers.
- No contamination attributable to the INEEL was identified in water samples collected at distant or Magic Valley monitoring sites, however, INEEL impacts can be identified at some sites along the southern boundary of the INEEL. Tritium concentrations at these sites were greater than background but less than 1 percent of drinking water standard. Chromium at these sites also exceeded background but was less than 5 percent of the drinking water standard.
- In 2003, the INEEL OP collected replicate groundwater, surface water and wastewater samples with the DOE's primary contractors. Results reported by INEEL OP were generally in close agreement to those reported by USGS, ESER, BBWI, ANL-W, and NRF for most analytes.

## **Radiation Monitoring Major Findings:**

The INEEL OP uses a combination of instruments that measure the environmental radiation levels from natural cosmic and terrestrial sources as well as from possible contributions from operations at the INEEL. Electret Ion Chambers (EIC) are deployed at radiation monitoring stations to measure cumulative exposure to penetrating radiation in milliRoentgens (mR) during each calendar quarter. The EICs are deployed at 91 monitoring locations on the INEEL, near the INEEL boundary, and at distant locations. In addition, INEEL OP uses high-pressure ion chambers (HPICs) to continuously measure the gamma radiation exposure rate in microRoentgens per hour ( $\mu\text{R/hr}$ ) at 11 fixed monitoring sites around the INEEL. The data collected by the HPICs at these sites are transmitted electronically to the INEEL OP staff for “real-time” assessment.

Ambient penetrating exposure measurements performed during 2003 were consistent with historical background measurements. Redundancy in data collection and use of passive radiation detectors provided adequate cumulative average exposure rates at each radiation monitoring location.

- No offsite environmental impacts from INEEL operations were detected with environmental ambient gamma radiation exposure-rate measurements.
- Comparisons of INEEL OP radiation monitoring results with DOE program results show relatively good agreement.

## **Quality Assurance for the ESP**

The Quality Assurance Program for the INEEL OP ESP defines the procedures that will ensure the quality and integrity of samples collected, the precision and accuracy of the analytical results, and the representativeness and completeness of environmental measurements taken. All analyses and quality control (QC) measures in the analytical laboratories were performed in accordance with approved written procedures maintained by each respective analytical laboratory. Sample collection was performed in accordance with written procedures maintained by the INEEL OP.

- No issues involving sample chain of custody, sample holding times, analyses of blank, duplicate, and spiked samples were observed during the calendar year 2003. Methodologies and data reports issued by the contracting laboratories conformed to the requirements of the INEEL OP.
- One significant quality assurance issue was identified during the fourth quarter of 2003. ISU-EML identified twelve groundwater samples that were affected by problems exhibited by a liquid scintillation counter for the technetium-99 analysis. The resultant concentrations for these samples exceeded the MDC in all 12 samples, which included samples from wells that had no prior history of technetium-99 contamination. The laboratory hypothesized that the problem was caused by an interaction between minerals in the sample water and the

liquid scintillation fluid used. Once a new fluid was employed by the laboratory, the technetium-99 analyses have been performed within quality control parameters.

- All data have been verified and deemed complete, meeting the requirements and data quality objectives established by the INEEL OP.

## **INEEL OP Mission**

The mission of the state of Idaho's INEEL OP is to provide the people of Idaho with independent, factual information about the INEEL, to help ensure the safety of the citizens of Idaho through the protection of public health and the environment, and to provide statewide radiological expertise. In partial fulfillment of this mission, the INEEL OP developed an Environmental Surveillance Program with the following objectives:

- Maintain an independent environmental surveillance program designed to verify and supplement DOE surveillance programs.
- Provide the citizens of Idaho with information that has been independently evaluated to enable them to reach informed conclusions regarding the potential impacts of present and future DOE activities to public health and the environment in Idaho.

Data from the environmental surveillance efforts outlined above are interpreted and reported by the INEEL OP on a quarterly and annual basis and are used to measure the impacts of DOE facility operations on the public and the environment. The INEEL OP's independent findings are also used to compare with data reported by DOE surveillance programs.

The most recent annual Environmental Surveillance Report documents the 2003 findings, identifies discernable trends, and presents the conclusion of the comparability of the data reported by the INEEL OP and the various DOE monitoring programs. The body of the report is used to scientifically evaluate information on potential INEEL impacts to the public and environment and independently report conclusions to the people of Idaho.

The 2003 ESP Quarterly Data Reports include the most recent data collected but provide little discussion or interpretation of the data. These reports can be found online at:

[http://www.oversight.state.id.us/ov\\_library/index.cfm#qdr](http://www.oversight.state.id.us/ov_library/index.cfm#qdr)

The state of Idaho and collaborating organizations will continue monitoring conditions at and near the INEEL to assess potential impacts on public health and the environment.